# Reptile and Amphibian Monitoring
# St. Croix National Scenic Riverway
3/3/2003

**Contact:** Robin Maercklein, 715 483-3284 ext. 642, robin_maercklein@nps.gov

**"The first rule of intelligent tinkering is to save all the parts."**

## Abstract:

Three methods are currently being used to document reptiles and amphibians within St. Croix National Scenic Riverway. They are through the use of artificial cover boards, frog and toad call surveys, and incidental turtle surveys. Although no new species were added to the park list through these monitoring efforts, 24 species have been documented including 6 new verifications for the park. Eleven species of amphibians have been documented raising the total verified for the Riverway from 14 in 1998 to 16 in 2002 out of a total of 19 species on the park list, or 84% verification. Twelve species of reptiles have been documented raising the total verified for the riverway from 12 in 1998 to 15 in 2002 out of a total of 24 species on the park list, or 63% verification. Preliminary ranges have been documented for these 24 species.

## Introduction:

Little work has been done to study the herpetofauna (herps) of the riverway. Early park species lists were derived from county lists, field guides, and anecdotal data including observation cards. Past scientific studies include a survey of wood turtle (*Clemmys insculpta*) distribution and abundance in 1984-1985 (Ewert, 1984, 1985). A second study in 1993 - 1995 studied the distribution and abundance of all turtles from Marine-on-St. Croix, Minnesota to approximately Grantsburg, Wisconsin. This survey extended the range of the false map turtle (*Graptemys pseudogeographica*) north to Osceola and confirmed the presence of smooth softshell turtles (*Apalone mutica*) in the lower St. Croix River near the mouth of the river. This study also included pitfall traps to obtain preliminary data on other terrestrial herps within the riverway. This data includes the only cricket frog sightings within the federal zone of the riverway.

The current monitoring methods were chosen to take advantage of low cost, the skills of existing staff, available staff time, and opportunities for environmental education.

## Methods:

### Artificial Cover Boards

The artificial cover boards used are described by Fellers & Drost in Measuring and Monitoring Biological Diversity, Standard Methods for Amphibians (W. Ronald Heyer, et.al., 1994) Simply stated, these boards consist of a six foot long 2"x12" untreated pine board laid on the ground to provide artificial cover for reptiles and amphibians. Each board is covered by two 2"x6" boards and separated from the 2x12 with 1/4" lathe. This

provides cover between the boards in addition to under the 2x12. These boards are placed in groups of four sets to make an array. Arrays were placed in four general locations (Figure 1.) near each of the four visitor centers in hopes of attracting participation from school groups. Each general location had two arrays, one each in a grassland and one in a forested area for a total of eight arrays. These were placed in late summer, 1998.

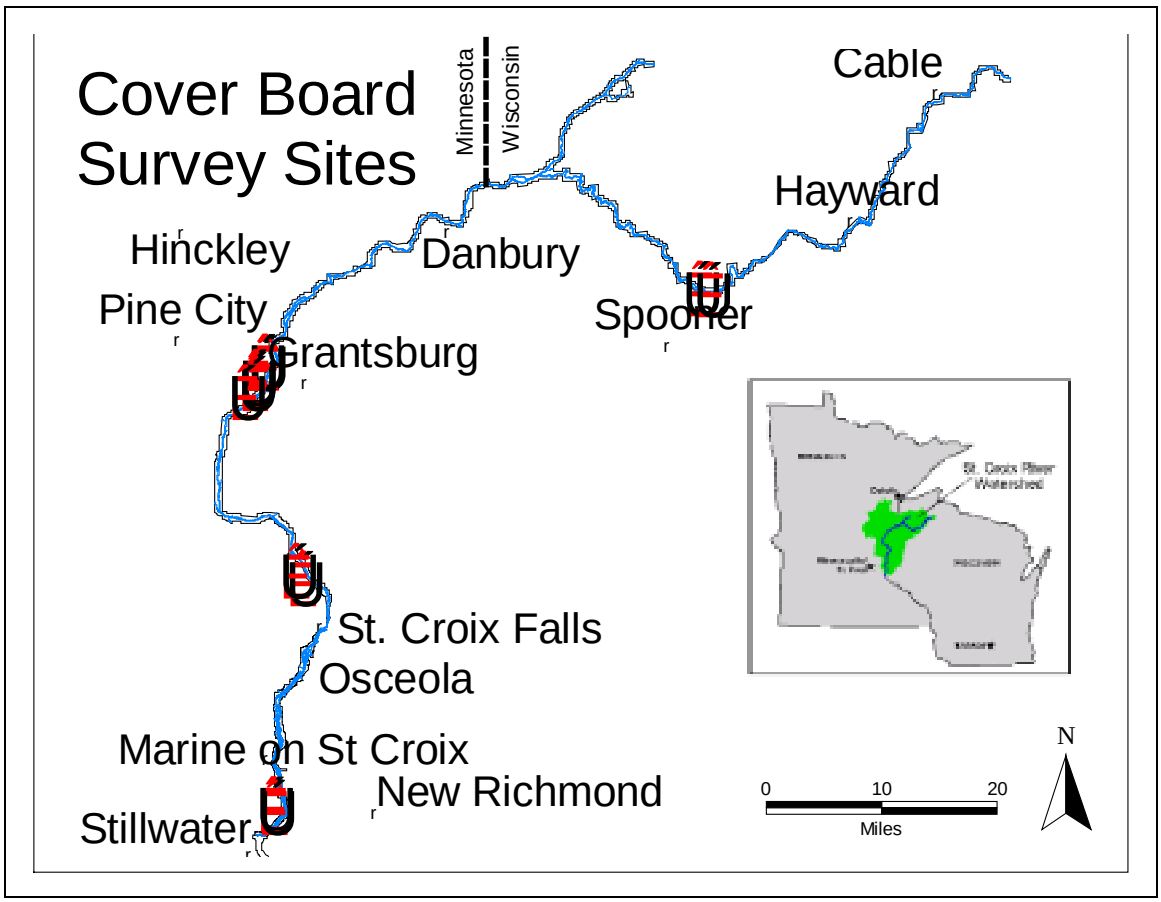


Figure 1. Locations of artificial cover board arrays within the riverway. This map shows only the current locations as of 2002.

Some changes have occurred to the location and number of arrays used since the original placement. The boards at the Wisconsin River Road Forest site, five miles north of the riverway headquarters, were repeatedly disturbed and finally stolen late in 1999. This site was replaced by the Wild Mountain Forest site, approximately one mile south of Wild Mountain Recreation Area north of Taylor's Falls in Minnesota. The original grassland site associated with the above array but located across the river in Minnesota, was moved to a better location, also near Wild Mountain Recreation area. Students from Grantsburg Middle School and High School constructed and helped place four additional arrays. One was placed adjacent to the Rock Creek Marsh Wildlife Management Area south of the Marshland Visitor Center in a grassland that burned in October 2000. The second was placed near a wetland in the forest near the Marshland Maintenance Shop.

The third and fourth arrays were placed at Tennessee Flats, one in the native prairie and one in the adjacent woods.

The other addition that occurred to the cover boards was the placement of transects of paired 'tree cookies' at the original Marshland sites in July of 1999. This is an adaptation of the salamander monitoring method from the North American Amphibian Monitoring Program. Tree cookies are 2 inch cross-sectional slices of trees, 11-14 inches in diameter and placed on the ground in pairs. The pairs are placed in a randomly selected compass direction from the original arrays spaced 20 feet apart. The Marshland Woods site received 21 pair and the Marshland Field received 23 pair of tree cookies. Several tree cookies were lost through flooding in Spring 2001 but most were recovered and replaced.

Artificial cover boards are checked when time permits. Ideally they would be checked once a week from April 15 to May 31 and September 1 to October 15, and twice monthly in June, July and August. Checking the boards consist of turning over the boards and capturing all herpetofauna found there. Before releasing, each animal is identified, weighed and measured. A standardized data form includes weather, time, date, mammals found, location and board, observer name, etc.

The boards are typically checked by park resource management staff or by other trained staff. In the Marshland District, students from neighboring schools have collected a considerable amount of data. The students have checked the boards under the supervision of trained park staff or teachers.

**Frog And Toad Call Surveys**

This is a standard method pioneered by Wisconsin Department of Natural Resources whose methods are followed. It is a roadside route consisting of ten stops alongside a selected wetlands. At each stop 5 minutes are spent listening for frogs and toads and recording an index of the calls heard for each species. These surveys are conducted three times each year; mid to late April, late May to early June, and early July. Birds heard calling are also recorded on the data form.

Two routes were established in 1999 (Figure 2.); The Lower St. Croix route starts at Somerset Landing and goes to 'Powell Farm' or 10 miles downstream from the Marshland Visitor Center. The Upper Namekagon route starts at Namekagon Dam and goes to Earl, Wisconsin. This route was first run during the second survey period in 1999. Two additional routes were added in 2001; The Upper St. Croix route extends from Coppermine Dam to Riverside. The Marshland route consists of five stops and extends from approximately Old Railroad Bridge Landing to the Marshland Visitor Center. This last route is conducted by the Marshland District Interpreter and/or students from the Grantsburg High School.

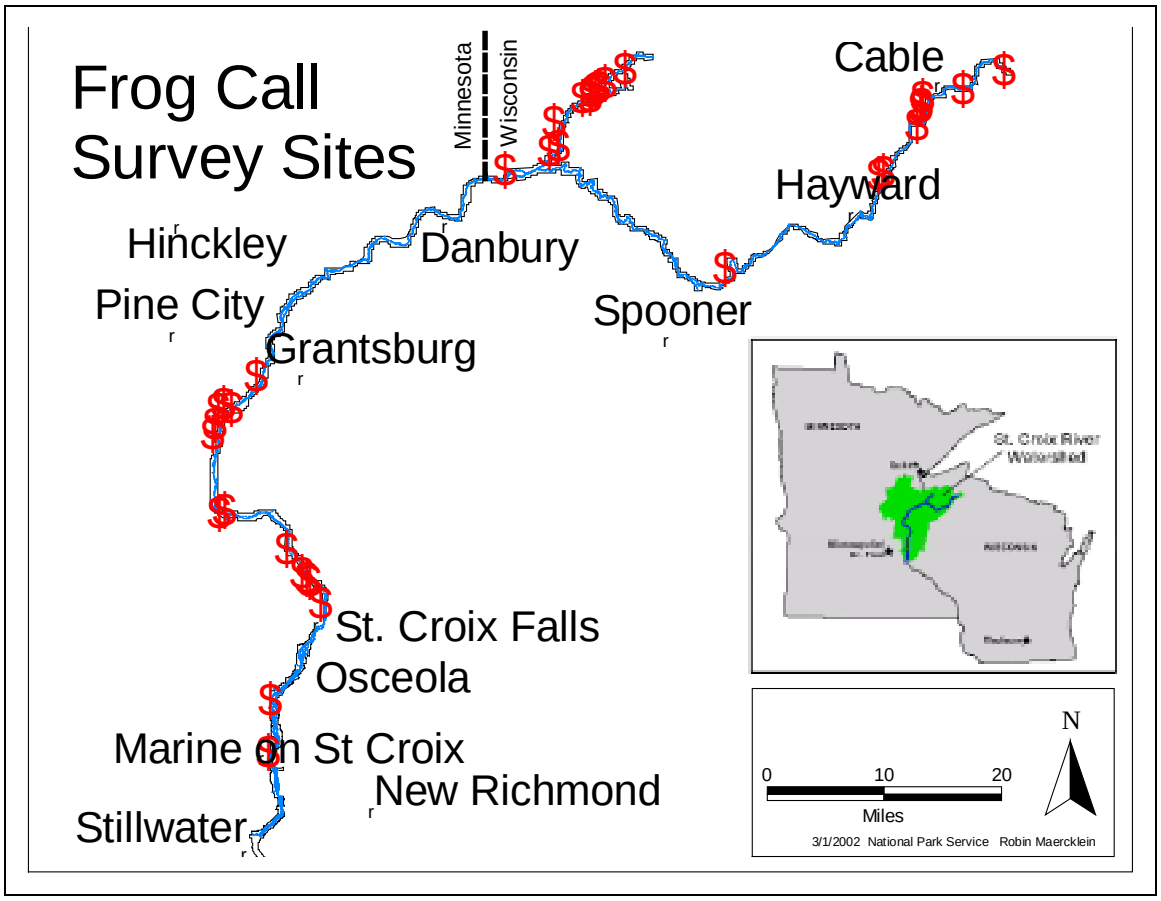

Figure 2. Locations of frog and toad call survey sites.

Routes were selected in an attempt to survey the entire riverway. Criteria for selecting individual sites were based upon; 1) presence of wetland as indicated by USGS Topographic 1:24,000 maps, 2) easy access by road, 3) proximity to other sites to make a feasible route, and, 4) in most cases, the wetland was preferably on National Park Service property, but always within the riverway boundaries. Sites were selected within the entire riverway with certain areas targeted for routes. These targeted locations included the upper St. Croix River, the upper Namekagon River, the Marshland District or middle portion of the riverway and the Lower St. Croix National Scenic Riverway. Areas that are currently missed include the lower Namekagon River and the lower half of the St. Croix River in Minnesota.

**Incidental Turtle Surveys**

As the name implies, this survey records turtles incidental to the task at hand while traveling on the river. A standardized form is used to collect data and includes the entry and exit point and time, weather, observer and the number of each turtle species observed. The result is that turtles are recorded by the segment of the river traveled (Figure 3). Participation in this survey began in 1999.

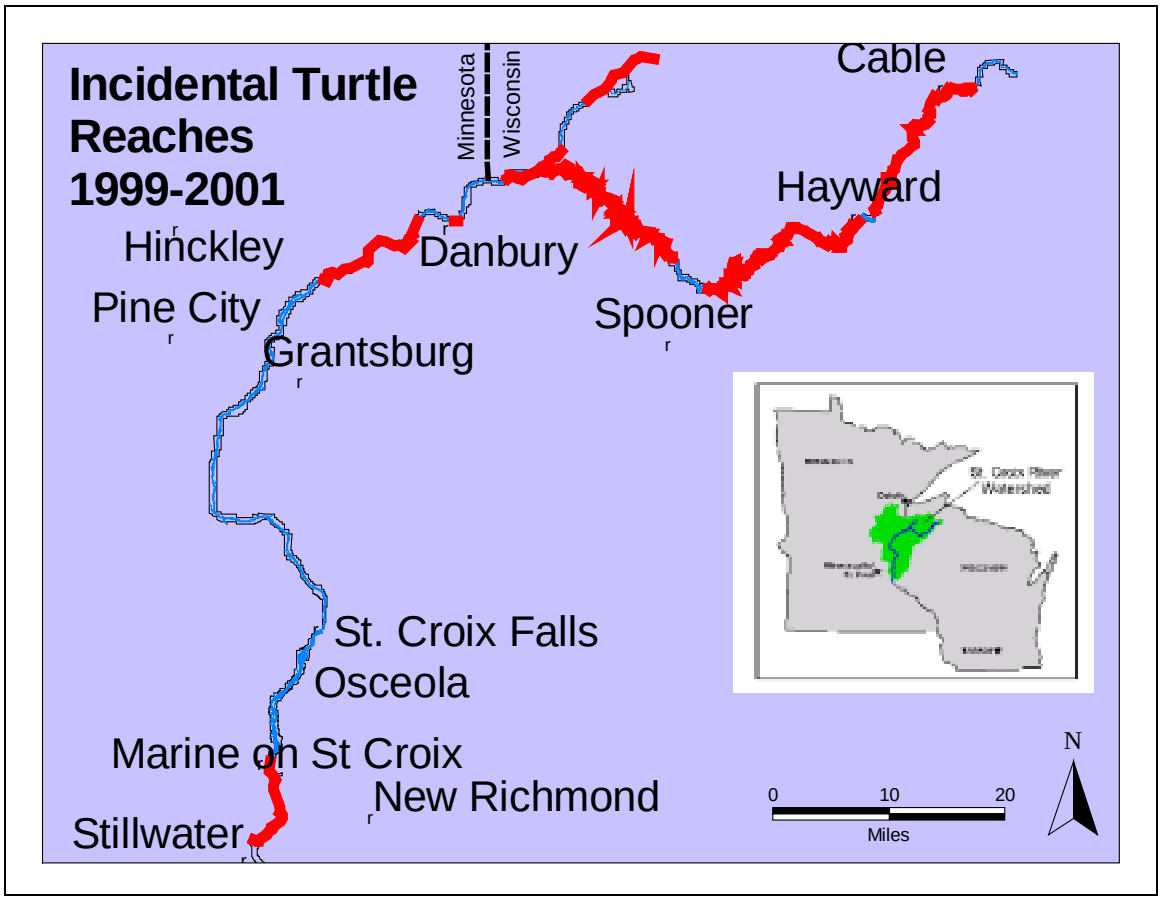


Figure 3. Portions of the Riverway where turtles have been recorded through the Incidental Turtle Survey, 199-2001. More areas were added in 2002, particularly between Grantsburg and St. Croix Falls.

## Results And Discussion

### Artificial Cover Boards

Eleven species of amphibians (Table 1.) and twelve species of reptiles (Table 2.) have been documented through these surveys. In addition, four mammal species have also been encountered; red-backed vole (*Clethrionomys gapperi*), meadow vole (*Microtus pennsylvanicus*), white-footed mouse (*Peromyscus leucopus*) and masked shrew (*Sorex cinereus*).

### Frog And Toad Call Surveys

Nine species of frogs and one toad have been documented through the riverway frog and toad call surveys (Table 1.). As expected, most species were found throughout the riverway and the survey served to document those ranges.

Mink frogs have been found at only three sites on the northern half of the upper Namekagon River route. This is the southern limit of the mink frog in Wisconsin though I also expected to find them on the upper St. Croix River route in Douglas and Burnett counties. However, Vogt (1981) documents only one documentation each in Douglas

and Burnett counties so this may also be at the western edge of the species range in Wisconsin.

Table 1. Amphibians of St. Croix National Scenic Riverway showing status and method of documentation.

| Species | Previous Studies | Frog Call | Cover Boards | Other Verification |
|---|---|---|---|---|
| Mudpuppy | | | | X |
| Blue-spotted Salamander | X | | X | |
| Spotted Salamander | X | | | |
| Tiger Salamander | | | | |
| Eastern Newt / Red Eft | X | | | |
| Four-toed Salamander | | | | |
| Eastern Red-backed Salamander | X | | | |
| American Toad | X | X | X | |
| Northern Cricket Frog | X | | | |
| Western Chorus Frog | X | X | | |
| Spring Peeper | X | X | X | |
| Cope's Gray Treefrog | | X | | |
| Eastern Gray Treefrog | X | X | | |
| Leopard Frog | X | X | | |
| *Pickerel Frog | | | | |
| *Bullfrog | | X | | |
| Green Frog | X | X | | |
| Mink Frog | | X | | |
| Wood Frog | X | X | X | |
| **Total verified** | **12** | **10** | **4** | **1** |

Cope's gray treefrogs are more associated with prairies and have thus been limited to just four sites; one on the upper Namekagon route at Earl Springs and three on the lower St. Croix River route at two of the Wisconsin River Road sites and at the north end of the route at 'Bensen'. Of the four sites, Earl Springs has been the most consistent.

Of the expected species, only two were missing; pickerel frog and northern cricket frog. The cricket frogs have been missed despite one call site being located approximately 200 feet from where pitfall traps documented their presence in 1993 and 1994. Communication with the researcher on that documentation suggested that it not be considered a viable documentation until more information on the capture and identification was investigated.

Statistical analysis has not been performed on this data. Most of these species appear to have stable, if fluctuating populations. Two species, American toad and eastern gray treefrog, appear to be declining. Spring peepers, with the highest average index, and western chorus frogs have population trends that appear to be increasing slightly.

Table 2. Reptiles of St. Croix National Scenic Riverway showing verification status and method of documentation.

| Species | Previous Studies | Cover Boards | Incidental Turtle |
|---|---|---|---|
| *Snapping Turtle | X | | X |
| *Wood Turtle | X | | X |
| *Blanding's Turtle | X | | X |
| Painted Turtle | X | | X |
| Common Map Turtle | X | | X |
| False Map Turtle | X | | |
| Spiny Softshell Turtle | X | | X |
| Six-lined Racerunner | | | |
| *Five-lined Skink | | | |
| Northern Prairie Skink | X | X | |
| Northern Water Snake | | | |
| Bullsnake | X | | |
| Brown Snake | | X | |
| Red-bellied Snake | | X | |
| Common Garter Snake | X | X | |
| *Eastern Hognose Snake | | X | |
| Western Hognose Snake | X | | |
| Ring-necked Snake | | | |
| *Blue Racer | | | |
| Smooth Green Snake | | | |
| Fox Snake | X | X | |
| *Pine Snake | | | |
| *Milk Snake | | | |
| *Timber Rattlesnake | | | |
| **Total verified** | **12** | **6** | **6** |

Mammals and birds are also recorded during the survey period. No new species have been verified but this has been particularly good for documenting night calling birds: rails, owls, and goatsuckers. Species are included in the following tables.

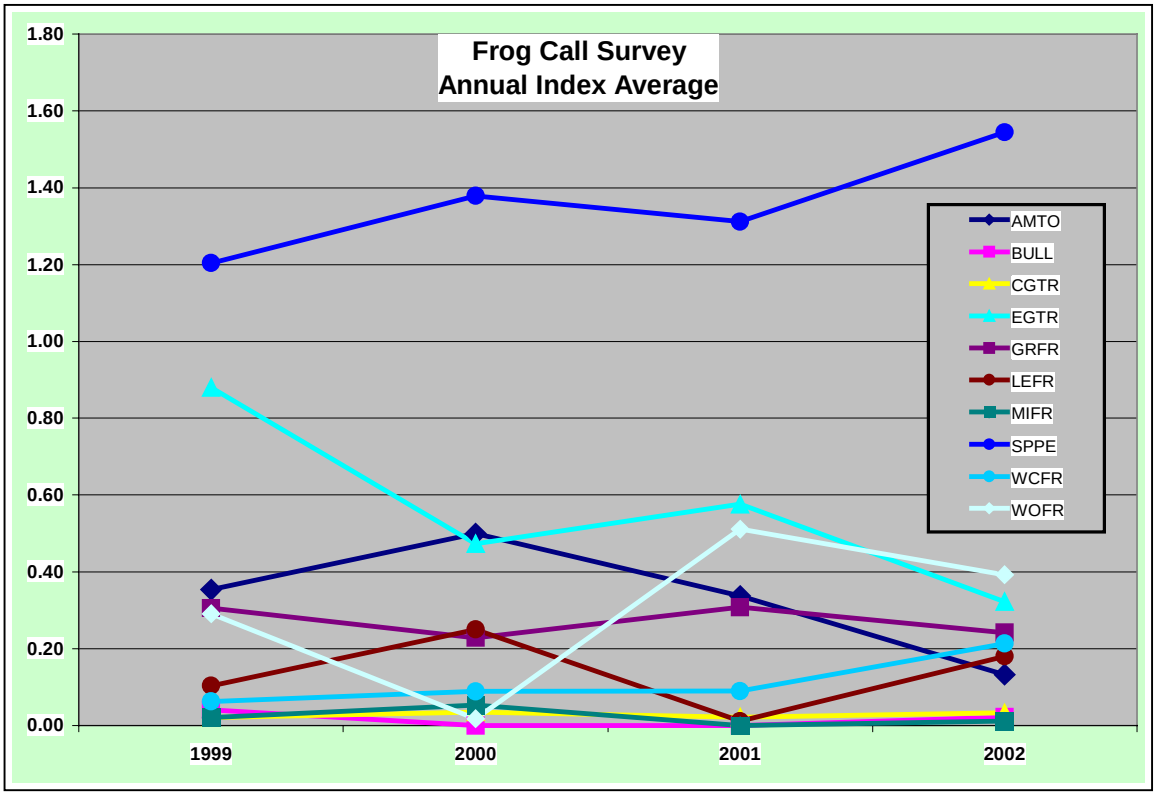


Figure 3. Annual index average from frog and call surveys for ten species. Species are in order listed in the legend: American toad, bullfrog, Cope's gray treefrog, eastern gray treefrog, green frog, leopard frog, mink frog, spring peeper, western chorus frog, wood frog.

**Incidental Turtle Surveys**

Turtles have been recorded on 72 trips from 1999-2002 (Table 5 and Figure 4). Two species, Smooth Softshell and False Map Turtle, are very rare and only found below Osceola, Wisconsin. The other six Riverway species are common above Stillwater and have been documented through these surveys.

Table 3. Mammals observed during frog and toad call surveys.

| **Mammals Observed During Frog and Toad Call Surveys** | |
|---|---|
| Virginia Opossum | Pine Marten |
| Eastern Cottontail | Beaver |
| Little Brown Myotis | Porcupine |
| Big Brown Bat | Red Fox |
| Red Bat | Gray Fox |
| Flying Squirrel | Eastern Striped Skunk |
| Woodchuck | White-tailed Deer |

Table 4. Birds observed during frog and toad call surveys.

| Birds Observed During Frog and Toad Call Surveys | | |
|---|---|---|
| Pied-billed Grebe | Spotted Sandpiper | Wood Thrush |
| Common Loon | Killdeer | Veery |
| Great Blue Heron | Mourning Dove | Hermit Thrush |
| Trumpeter Swan | Barred Owl | American Robin |
| Canada Goose | Northern Saw-whet Owl | Warbling Vireo |
| Wood Duck | Eastern Screech-Owl | Yellow Warbler |
| Mallard | Great Horned Owl | Ovenbird |
| Blue-winged Teal | Whip-poor-will | Common Yellowthroat |
| Ring-necked Duck | Common Nighthawk | Rose-breasted Grosbeak |
| Lesser Scaup | Belted Kingfisher | White-throated Sparrow |
| Ruffed Grouse | Eastern Phoebe | Song Sparrow |
| Wild Turkey | Eastern Wood-Pewee | Swamp Sparrow |
| Sora | Blue Jay | Red-winged Blackbird |
| American Woodcock | Sedge Wren | Brown-headed Cowbird |
| Common Snipe | Marsh Wren | |

Biases in this survey are many. Forms are only filled out when turtles are observed resulting that frequency is only measured as a percentage of those trips when a turtle was observed. This survey is incidental to the task at hand and turtles may be overlooked as they are not part of the primary study. Observer bias is also common as some observers are more likely to record observations than others. Finally, the frequency of visits to each stretch of river vary greatly.

Despite the inherent flaws in this survey it has proven to be useful in both documenting presence of species and their ranges. for example, Common Map Turtles were rarely listed prior to 2002. In 2002, new stretch of river, Thayers to Soderbeck, was included in this survey. Here, 165 map turtles were observed over a two day period making it observed almost as frequently as the painted turtle.

Table 5. Annual numbers of each species observed where n = the number of trips where observed turtles were recorded.

| **Common Name** | **1999** n = 10 | **2000** n = 14 | **2001** n = 23 | **2002** n = 25 |
|---|---|---|---|---|
| Blanding's Turtle | | 5 | 8 | 2 |
| Common Map Turtle | 6 | 9 | 14 | 204 |
| Painted Turtle | 31 | 95 | 198 | 266 |
| Snapping Turtle | 2 | 1 | 3 | 6 |
| Spiny Softshell Turtle | 16 | 6 | 28 | 69 |
| Unidentified Turtle | 17 | 14 | 13 | 6 |

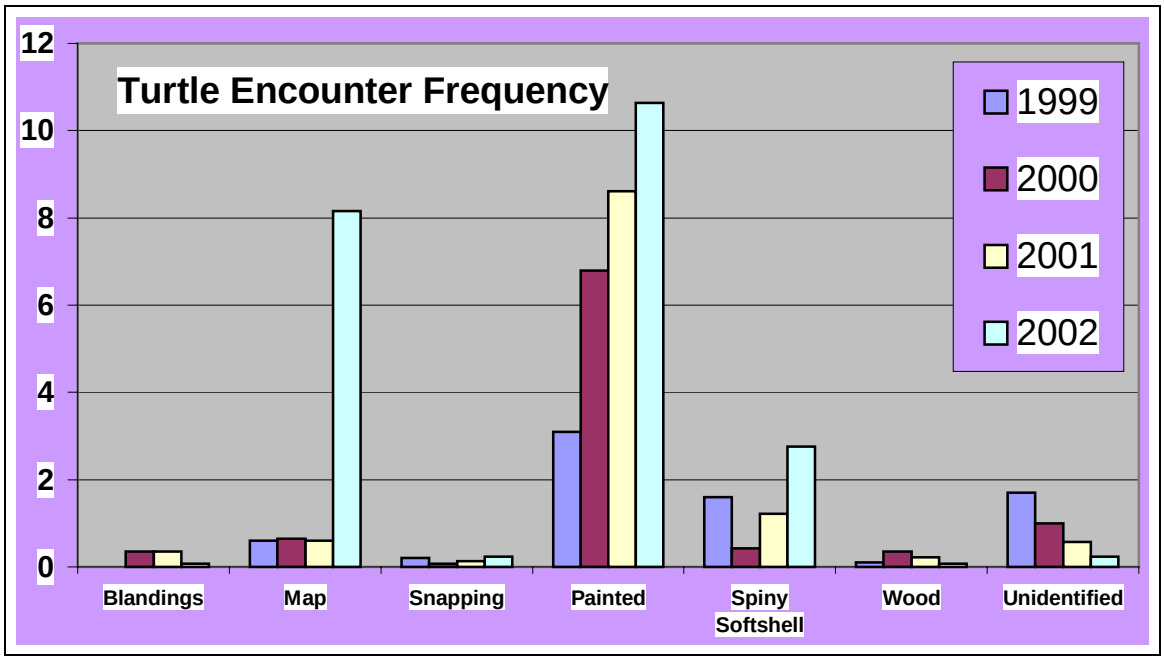


Figure 4. Turtle encounter frequency expressed as the annual number of turtles encountered divided by number of trips where turtles were recorded, where n = number of trips per year, 1999 n=10; 2000 n=14; 2001 n=23; 2002 n=25.

## References

Ewert, M. A. 1984. First Year Report: Assessment of the Current Distribution and Abundance of the Wood Turtle (Clemmys insculpta) in Minnesota and Along the St. Croix National Scenic Waterway in Wisconsin. Bloomington, Indiana.

Ewert, M. A. 1984. Second Year Report: Assessment of the Current Distribution and Abundance of the Wood Turtle (Clemmys insculpta) in Minnesota and Along the St. Croix National Scenic Waterway in Wisconsin. Bloomington, Indiana.

Heyer, W. Ronald, et. al. Measuring and Monitoring Biological Diversity, Standard Methods for Amphibians. Smithsonian Institution Press, Washington D.C.

Vogt, Richard C. 1981. Natural History of Amphibians and Reptiles in Wisconsin. The Milwaukee Public Museum, Milwaukee, Wisconsin.